

## CHAPTER 1

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# One Strategy Shared by Many

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# Introduction

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*"These waters, which in 1899 produced nearly one-third of the salmon catch of the world, are generally known as Puget Sound."*

*Report of the U.S. Commissioner of Fish and Fisheries, 1902[j1]*

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Tribal ancestors of the Pacific Northwest believed that salmon were another tribe that had gone to live in the ocean. The returning runs of salmon each year were an annual gift from the ocean people to their terrestrial counterparts. The abundance of salmon runs in the 19th and 20th centuries has become legendary, and salmon formed the basis of tribal sustenance and economies. Early settlers to Puget Sound also depended on marine resources for their food source and livelihood. A letter in late 1854 from the first territorial governor, Isaac Stevens, indicated that, "The Indians on Puget Sound...catch most of our fish, supplying not only our people with clams and oysters, but salmon to those who cure and export it." Stevens was given the charge of negotiating treaties with Washington Indian tribes to arrange the transition to a new society, and open the way for farming, lumbering and other industries. Population growth in the Pacific Northwest exploded in the late 1800s following the completion of the transcontinental railway, and white settlers flocked to the territory to take advantage of opportunities based on fertile soils, vast stands of timber, and abundant fisheries. Even though 150 years have passed since Governor Stevens signed the treaties, salmon still represent an intrinsic part of the Pacific Northwest identity. Tourists and local residents sporting salmon t-shirts still enjoy watching the large fish get tossed

over the counter at the Seattle Public Market, salmon banners and statues adorn community streets, and recreational fishing skills are passed from generation to generation when (increasingly rare) opportunities arise.

Unfortunately, the condition of some Puget Sound salmon runs threatens the viability of this resource as a Pacific Northwest icon. Although salmon have always been subject to natural fluctuations across their range, scientists have warned of the degradation of salmon and



From the collection of the Washington State Archives.

**SHARED STRATEGY FOR PUGET SOUND**  
working with communities to restore habitat

**Shared Strategy Planning Areas**

0 5 10 20 Miles

has been an inspiration to Puget Sound residents of all ages and occupations. The final return of the nutrients from their decomposing bodies completed the gift of the ocean tribe to the plants, animals and trees that dwell on the land.

Nestled between the Cascade and Olympic mountains in Northwest Washington State, the Puget Sound Basin is the second largest estuary in the United States and covers more than 16,000 square miles. Land constitutes 20 percent of the area, with the remainder consisting of freshwater,

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## Puget Sound Salmon Recovery Region



Figure 1.2

estuarine, and marine waters. Over 20 major river systems and their tributary creeks drain mountain elevations of 7,000 feet or more (with Mt. Rainier at twice that height) that drop to sea level within 50 to 70 miles. The upper portions of most Puget Sound rivers flow through natural preserves and working forest lands. As they descend, they meander through agricultural lands, small woodland lots, local parks and small towns, and in some cases, busy city suburbs and urban areas. Extensive glacial and tectonic activities have created a rich and diverse landscape that nurtures some of the most productive habitats in the world. Salmon and bull trout rivers were shaped when glaciers carved a myriad of streams, lakes and valleys, and serve as a bridge between the land and the ocean. Deposits of cobble, silt and volcanic ash provided the parent materials for the distinct structure of today's watersheds, marine shorelines, and protected embayments. From the forested slopes of the Olympic Mountain foothills, the fertile Skagit River floodplain, the rich tidal mudflats of the southern inlets to the rocky shores of the San Juan Islands, the health of Puget Sound depends on these diverse environments.

Although the Puget Sound basin is famous for its rain, two-thirds of the annual precipitation falls during November through March. Salmon and bull trout depend on rivers that are fed by glacial melt, snow and rainfall, and the region relies almost entirely on snowpack during the dry summer months. The Olympic Mountains form a natural barrier to storms coming off the Pacific, and cast a "rainshadow" of dryness in portions of Puget Sound. Annual precipitation in western Washington can vary from 17 to over 100 inches a year depending on location and topography.

Favorable natural features including lush timber resources, protected embayments, and soil-rich river deltas led to the development of

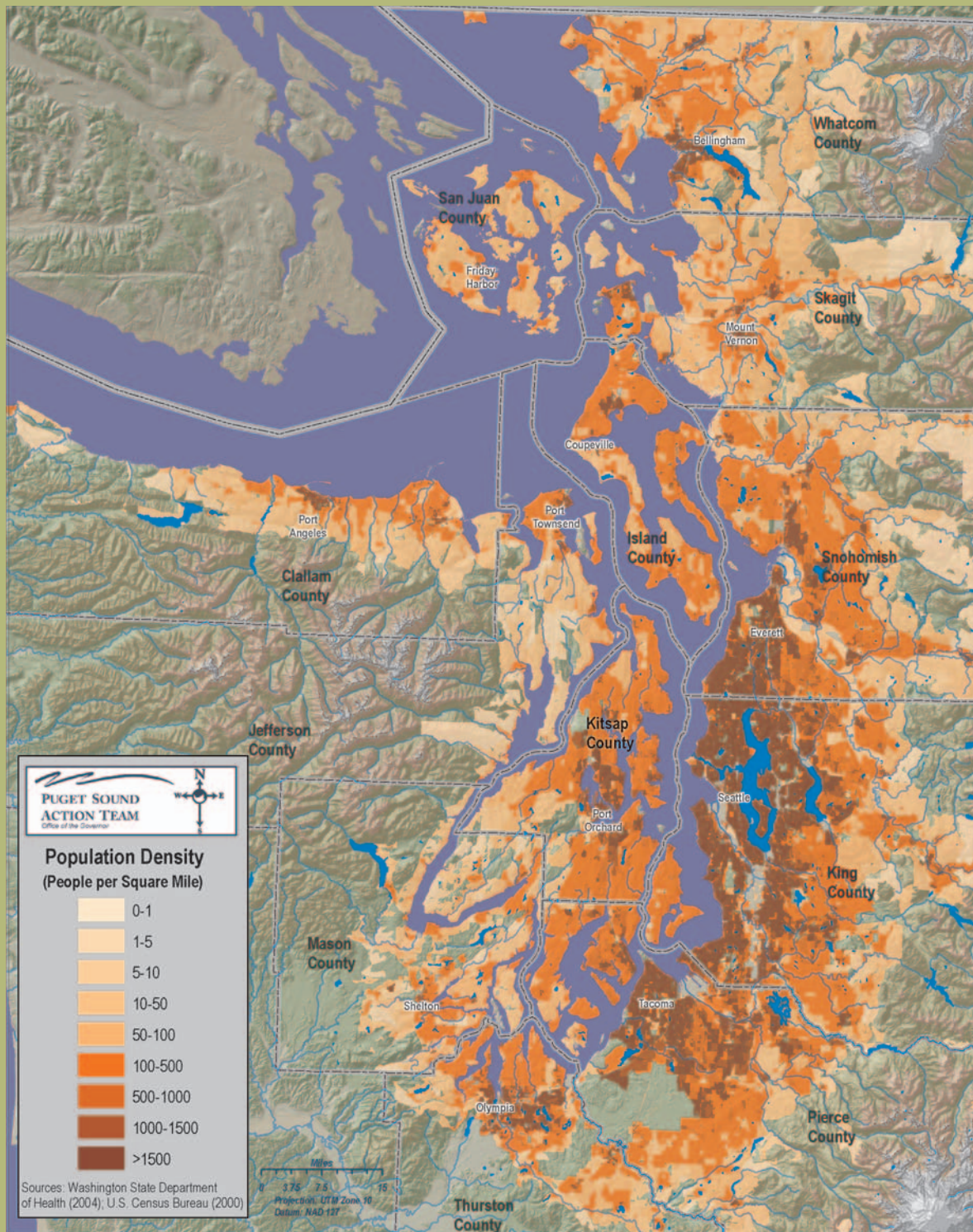
agricultural and commercial centers throughout the Puget Sound region. Today, Puget Sound is home to 3.8 million people, two-thirds of the State's population. By 2020, another 1.4 million people are expected to settle around the Sound. Homes, roads, water supply, sewer systems, business, industries and recreational areas will accompany the growth which is fueled by an attractive quality of life and opportunities for employment in high-tech and other industries.

The location of major urban metropolitan areas which are centered around Seattle, Everett, Tacoma and Olympia, create unusual challenges to the protection and restoration of threatened populations of salmon and bull trout that still co-exist in these watersheds.

### Puget Sound Salmon and Bull Trout at Risk

Dwindling runs of salmon and bull trout in several river systems in the Pacific Northwest prompted a number of organizations in the 1990s to evaluate the status of these fish throughout the region. Several petitions were filed to the National Marine

## Puget Sound Population Density



Puget Sound Population Density Map courtesy the Puget Sound Action Team.

**Figure 1.3**



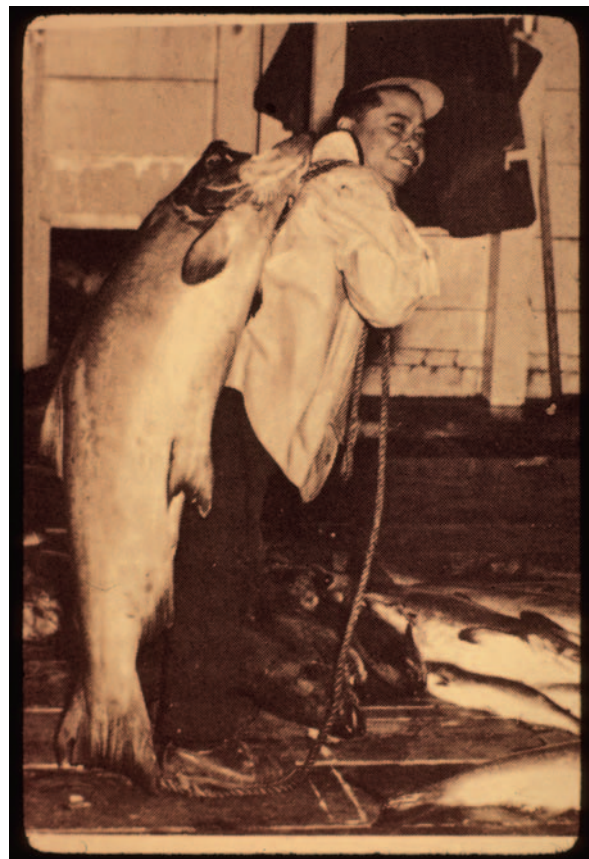
Fisheries Service and US Fish and Wildlife Service requesting protection for specific runs of salmon and bull trout under the Endangered Species Act. These petitions complemented the growing concern by the agencies about the overall health of West Coast stocks of Pacific salmon and bull trout. Following a comprehensive technical review, three species in the Puget Sound region were found to be at particular risk and merit additional study and protection under the Act: Puget Sound Chinook, the Hood Canal summer run of chum salmon and Coastal-Puget Sound bull trout.

Chinook Salmon (*Oncorhynchus tshawytscha*), commonly known as "Kings," were called the "Tyee" or chief by the Indians of the Pacific Northwest. These salmon are the largest of the Pacific salmon species, achieving sizes over 100 lbs in some river systems. The species historically ranged from the Ventura River in California to Point Hope, AK in North America, and in northeastern Asia from Hokkaido, Japan to the Anadyr River in Russia. Chinook salmon exhibit a complex life history as they develop from egg to juvenile and returning adult, which is intertwined with the streams, estuaries and ocean environments they inhabit.

The decline of Puget Sound Chinook salmon has occurred over the past 100 years, but has accelerated rapidly in the last two decades. Historical data indicate that the harvest of Puget Sound Chinook peaked in 1908, with a cannery pack of 95,210 cases of canned Chinook salmon. While the extrapolation of this number to fish population estimates should be viewed cautiously, it corresponds to a figure of 690,000 adult Chinook returning to Puget Sound that year. Naturally-spawning Chinook are well below peak historical levels, with a cumulative run size of 13,000 returning adult fish in North Puget Sound, and approximately 11,000 in South Sound tributaries in the mid-1990s. Most of the remaining natural production of Puget Sound Chinook is concentrated into just two watersheds (Skagit and Snohomish), making them vulnerable to catastrophic events, and many watersheds exhibit less

than 100 returning adults. It is believed that 31 different populations of Puget Sound Chinook existed historically, and that nine of these populations have already become extinct (NMFS/BRT, 1997). Although many positive actions have been taken in the region to protect and restore the remaining 22 Chinook populations, the threats facing the Chinook at the various stages of their life cycle were not sufficiently reduced by the late 1990s to provide enough certainty for their long term survival. The National Marine Fisheries Service thus determined that protections and improvements beyond those already underway were needed for Puget Sound Chinook under the Endangered Species Act.

Chum Salmon (*Oncorhynchus keta*) are known for the striking body coloring and enormous canine-like fangs of spawning males, which led to their nickname as "Dogs." The species has the widest natural geographic and spawning distribution of any Pacific salmonid, primarily due to the extent of its range up along the shores of the Arctic Ocean.



Elwha man with chinook salmon. Photo courtesy Jamestown S'Klallam Tribe.

Chum salmon have been documented to spawn from Korea and Japan around the North Pacific rim as far south as Monterey Bay in California. Chum salmon may have been the most abundant of all salmon, and constituted almost 50 percent of the biomass of all salmonids in the Pacific Ocean prior to the 1940's. Migration to saltwater begins almost immediately after the young chum emerge from their gravel spawning beds, thus the survival and growth of juvenile chum depends highly on favorable estuarine conditions.

Biologists in both Asia and North America have used run-timing differences to divide the species into early (summer) and late (fall) runs. Chum salmon generally return to their natal spawning streams on both continents progressively later in southern areas. Within Hood Canal, sharp differences occur between the summer chum runs, which spawn from early September to late October, and the fall runs which spawn from early November to late December. Information as far back as 1913-14 from the Big Quilcene River in northern Hood Canal specified almost a month's separation between the two runs.

Of the 16 historical summer chum populations in Hood Canal and the eastern Strait of Juan de Fuca identified by scientists, seven populations are presumed to be extinct, the status of one population is unknown, and eight streams still have existing runs. The remaining populations have run sizes ranging from less than 10 to 4,500 spawners, but the long term trend indicates that most populations are declining at a rate of six percent a year. State, tribal and volunteer efforts to rebuild summer chum runs appear to be having a positive short-term effect. Despite the strong returns to some streams however, Hood Canal summer chum salmon are still considered to be at risk of extinction, since their long term survival is dependent on changes to hatchery management, harvest management and habitat conditions.

Bull Trout (*Salvelinus confluentus*) are char native to the Pacific Northwest and western Canada.

Although bull trout and Dolly Varden (*Salvelinus malma*) were once considered to be a single species, they have been formally recognized as separate species by the American Fisheries Society since 1980, based on evidence related to their



Photo courtesy Washington Department Fish & Wildlife.

**Adult male chum spawner.**

measurements, bone structure and distribution. Historically, bull trout ranged from the McCloud River in northern California and the Jarbidge River in Nevada, to the headwaters of the Yukon River in the Northwest Territories of Canada. They are also dispersed throughout the tributaries of the Columbia River Basin, including headwaters in Montana and Canada, and east of the Continental Divide in Alberta and British Columbia. Various populations of bull trout are observed to be "resident" in freshwater streams or migrate to larger rivers, lakes or saltwater for a portion of their life cycle. The Coastal-Puget Sound segment of bull trout in Washington State is considered to be significant to the species as a whole because it is thought to contain the only forms of bull trout in the coterminous United States that migrate to saltwater for a portion of their life cycle.

In their evaluation of bull trout throughout the Pacific Northwest, the US Fish and Wildlife Service concluded that many individual river basins within the Coastal-Puget Sound region have declining populations of bull trout and are subject to considerable fragmentation. Bull trout are isolated above dams or other diversion structures in seven basins in the Coastal-Puget Sound area. Although several populations of bull trout are largely within national park or wilderness areas, they are threatened by habitat degradation outside of the restricted boundaries, and have been impacted by the intro-

duction of other competing species. The majority of Coastal-Puget Sound basins have an unknown status for bull trout, one population in the lower Skagit River is considered to be strong, and at least 10 core areas are considered to be depressed or at risk. The declining trend of Coastal-Puget Sound bull trout overall, the documented threats to habitat from low flows, migratory barriers, road density and other habitat loss, and the pressure from introduced, non-native species led the USFWS to list Coastal-Puget Sound bull trout as threatened on November 1, 1999.



Photo courtesy the US Fish & Wildlife Service



# Vision and Goals of the Puget Sound Community

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*"We have an opportunity to do something extraordinary-to save a species from expiring, not only on our watch, but on the watch of our great grandchildren."*

*King County Executive Ron Sims (Shared Strategy Summit 2005)*

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## **The Shared Vision**

Across Puget Sound, leaders at all levels aspire to a future in which the Puget Sound region has demonstrated to the world that economic prosperity, more people and a healthy environment can co-exist. The many contributors to this plan hope that fifty years from now, their great-grandchildren will be able to say:

Our elders got it right. They listened to what the salmon were telling them. Anticipating the region's growth, the choices they made in the early 2000's and the hard work that followed, created the vibrant community we share today, where both people and nature thrive and the salmon are once again teeming in our rivers and streams.

Furthermore, the plan's contributors hope that by 2055:

- Puget Sound's fresh and marine waters are healthier for all species.
- Chinook abound in numbers that enable harvest by all and Tribes are once again able to meaningfully exercise the right to catch fish that they reserved in their treaties with the United States government two centuries ago.
- Hatcheries are used only where necessary to supplement and enhance wild fish consistent with best scientific knowledge.
- All the major rivers and many of the smaller streams in each watershed are places where people go to enjoy nature and watch salmon with their kids and grandkids. People stroll, kayak, canoe, boat; enjoying river deltas and estuaries, that have been restored and now burst with wildlife. Young salmon feed in these restored estuaries adjacent to marinas and ports as they prepare for their epic ocean journey. As the young salmon leave their rivers of birth they swim through the protected shallow waters adjacent to the land all the way to the sea.
- The region is friendlier to business than it was fifty years ago. Environmental laws are clear, predictable, effective and efficient. Small and large businesses are growing and easily find skilled workers from their local communities. The prosperity of the regional economy is enhanced by our commitment to a sustainable environment and marketing of eco-friendly products.
- Rural communities have prosperous farms that significantly contribute to the health of the land and water.

People throughout the region are excited and motivated to buy produce grown in harmony with ecosystem needs. Timberlands also are managed to provide renewable wood products and protect restored rivers and streams. There is strong public support to protect working landscapes (such as farms and timberlands) and the region is known internationally for its creative approaches to land stewardship.

- Propelled by the success of saving salmon, the region is addressing even tougher problems like water and alternative energy sources. All of these efforts are characterized by a true partnership between citizens, businesses and governments. As a whole, people take pride in the fact that our region is built on a sustainable economy and healthy natural environment. In short, the region has become a world model for how our ecosystem and economy can both flourish to the benefit of all who share it.

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*"My grandmother said that the Nisqually Indians taught the settlers to pull pitchforks of dead salmon from Chambers Creek to fertilize their gardens, and that there were so many dead salmon you could smell the creek from a long way away. We will know that we have recovered salmon when we can once again smell them from a mile away."*

*John Ladenburg,  
Pierce County Executive Director*

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**Aspirations for salmon can take a technical, societal, cultural, or even an olfactory form.**

Treaty Indian tribes of western Washington have a unique cultural relationship with salmon, and seek to protect their treaty rights to harvest the celebrated fish. Scientists look to preserve the genetic diversity and the ability of salmon to sustain themselves in the long term, and offer technical parameters to assess whether recovery is being attained. Many landowners and businesses have stepped



Photo courtesy the King County Department of Natural Resources.

forward to work in concert with salmon recovery while retaining the economic viability of timber, fishing, recreation and agriculture. Many local governments and citizen groups have worked for many years to restore salmon habitat. All of these groups have been working together in partnership across the Sound to prepare this recovery plan.

### **One Strategy Shared by Many**

The Shared Strategy for Puget Sound is a collaborative initiative built on the foundation of local efforts, supported by leaders from all levels of government and sectors of our communities, and guided by the Puget Sound Technical Recovery Team's regional recovery criteria. The collective, overarching goal of the Shared Strategy salmon recovery plan is:

To recover self-sustaining, harvestable salmon runs in a manner that contributes to the overall health of Puget Sound and its watersheds and allows us to enjoy and use this precious resource in concert with our region's economic vitality and prosperity.

Since many of the actions to recover Chinook are also expected to help bull trout, the Shared Strategy effort is also expected to support US Fish and Wildlife Service's stated goal for bull trout (USFWS, 2004):

To ensure the long-term persistence of self-sustaining, complex interacting groups of bull trout distributed across the Coastal-Puget Sound Distinct Population Segment, so that the species can be delisted.

### **Factors for Success**

The Puget Sound community has a rich history of success in addressing natural resource challenges, and the people of the Puget Sound region are committed to protect and restore the land and waters that define their quality of life. This commitment will be tested as the region works to address the challenges facing salmon recovery efforts over the next several decades.

It is in part the history of success that helped build the confidence on which several key assumptions of this plan are based. To make the assumptions come true, the plan builds on the legacy of past leadership and relies upon this region's current and future leaders to step up as their predecessors did to make the tough decisions and search for innovative solutions.

### **The key assumptions are:**

**More People and More Salmon:** Perhaps the most far-reaching assumption of this plan is that this region can accommodate human population growth and recover salmon runs at the same time. Over a million more people are projected to live in Puget Sound in the next 15 years. During this same period, the Recovery Plan aspires to add many more salmon, on the order of a twenty percent increase. Achieving the salmon goals will require protecting existing habitats and building more homes for salmon (habitat restoration) as we build more homes for people. This plan provides the blueprint for how we can accomplish such a Herculean task.

**There Still Are Enough Fish and Habitats to Build on For Recovery:** Another fundamental assumption of this plan is that the Puget Sound region still has sufficient Chinook populations left to achieve recovery in the long-term. The 22 populations left in Puget Sound represent significant reduction in diversity from the over 30 populations believed to have existed in the past. All remaining populations are important. Some are stable at low levels and others are still in decline. Scientists contributing to this plan believe we must act quickly to protect remaining populations and to restore the productivity of all Puget Sound watersheds and marine waters. While science doesn't have the answers to all the tough questions, there is enough information to act now. Delaying or weakly stepping into implementation will diminish our options and opportunities to achieve recovery.

**Science Can Help Us Make Wise Policy Decisions:** This plan was developed with a strong



partnership between scientists and policy makers at local and regional levels. The intent behind such a partnership is to make the best decisions to achieve a future that supports people and the environment. This plan is based on years of scientific observation, testing of hypotheses, multiple lines of evidence, monitoring and learning. The policy and technical elements in this plan incorporate the best available science to date for salmon recovery. This plan relies upon the continuation of a strong interface between science and policy as new scientific information comes to bear on future policy decisions.

Inclusive, transparent collaborative processes create better and more sustainable results: At the start of the Shared Strategy salmon recovery initiative, participants agreed to a voluntary, collaborative process. They believe that issues as complex as salmon recovery that span urban and rural landscapes, multiple jurisdictions and involve actions affecting many sectors of a community cannot be satisfactorily solved by a single entity or point of view. Collaborative processes have their limitations too, sometimes justly criticized for taking too long and succumbing to the lowest common denominator. However, if done right, they still offer the best opportunity for finding creative solutions that address multiple interests. When people with a stake in the outcome have a say in the decisions, they are more likely to implement them.

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*"Citizens are turning to these collaborative processes with increased frequency in the West as they realize that in many cases they are the only path out of gridlock...the real virtue of democracy is that it is a school. In it we learn how to manage the public aspects of our lives, and thus, unlike other systems of government, it is progressive-we can actually get better at it as time goes on."*

William D. Ruckelshaus  
(from *Restoring Trust in Government,  
or Get in the Boat and Row*, 1-13-04)

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The contributors to this plan believe that the Shared Strategy's collaborative approach and partnership with local communities created a better and more sustainable plan than might otherwise have occurred. The plan's contributors understand that this type of approach will need to continue during the implementation phase to build commitments to action and increase the likelihood of achieving the Puget Sound community's vision and goals

#### **Local Communities are the Essence for**

**Success:** A fundamental assumption of this plan is that local watershed efforts are the engine that will lead the region to recovery. This is because many groups had already been working for years before the listing to improve conditions for salmon in their local river basins. Each local watershed area has unique assets in terms of technical ability, partnerships and regulatory frameworks; this plan tailors recovery strategies and actions to the political, cultural, economic, and ecosystem needs of individual watersheds across the Sound. These groups know the most about what is needed and what would work best both technically and politically in their local areas.

Restoration and protection actions will take place largely at the watershed level. Within Puget Sound, fifteen watershed planning areas plus a nearshore group have prepared detailed salmon recovery chapters that are a fundamental part of this plan. The chapters are Volume II of this plan and summary profiles of each can be found in Chapter 6 of this document. Commitments at the local watershed level to implement the steps necessary for recovery in both the short and long-term are essential for success. Although each watershed has its own unique set of circumstances, every watershed contains active and committed government and citizen groups contributing to the salmon recovery process.

This recovery plan provides a scientifically-based, practical and cost-effective guide for restoring and protecting salmon runs across Puget Sound. Through this plan, the people living and working in Puget Sound hope to secure a future with healthy watersheds, plentiful fish, strong communities and a viable economy.

# The Shared Strategy Approach to Puget Sound Recovery Planning

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*"The most impressive thing to me in all this is the degree of cooperation everyone is showing...In the watersheds in Puget Sound where people are listening to one another, trying to understand what the world looks like to their neighbor, whether tribal member, farmer, forest owner, government official, fisherman or just someone concerned about the future of the place where they live and where people are working together to ensure a prosperous future-when all this is happening-it's like magic."*

William Ruckelshaus

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## Existing Efforts to Protect and Restore Salmon and Bull Trout

Federal, tribal, state and local leaders are not new to the salmon crisis. In response to dwindling populations of salmon and a commitment to sustainable fisheries, treaty Indian tribes and Washington State fisheries managers have curtailed the harvest of Puget Sound salmon by as much as 90 percent in the last 20 years. Local governments have made strides to protect salmon through land use, stormwater and growth management authorities. Numerous individual watershed councils and regional fish enhancement groups already had undertaken scientific studies and restoration activities throughout the Sound well before listing occurred. State and tribal co-managers also began tailoring annual and long term harvest and hatchery management plans to be consistent with recovering declining salmon runs prior to listing. Businesses such as hydropower utilities and timber companies prepared licensing agreements and regulatory proposals directed toward improving their practices with respect to salmon.

Although the regulations to conserve a threatened species and prepare a recovery plan are federal responsibilities under the Endangered Species Act, the state of Washington determined the need to take a proactive direction for salmon recovery. In 1998 and 1999, the Washington State Legislature adopted the Salmon Recovery Planning Act, the Salmon Recovery Funding Act, and the Watershed Planning Act to involve local watershed groups in watershed management, and habitat protection and restoration. Governor Gary Locke adopted the 1999 "Statewide Strategy to Recover Salmon: Extinction is Not an Option" and formed the Governor's Salmon Recovery Office (per the Salmon Act) to coordinate and assist in the development of state and regional salmon recovery responses. The legislation also created the Salmon Recovery Funding Board to provide fiscal oversight of salmon recovery efforts in Washington State, and ensure that these actions are scientifically sound and supported by their communities. Despite all of these contributions to salmon recovery at the local and state level, the listing of Puget Sound Chinook and other species affirmed the need for more and better coordinated action to halt the decline and strive for recovery.

## Formation of the Shared Strategy for Puget Sound

Puget Sound leaders recognized the need to link the widespread efforts for salmon recovery, and developed a coordinated regional approach. Shortly following the 1999 determination of Puget Sound Chinook as a threatened species, a group of over 150 representatives of federal, state, tribal and local governments and salmon recovery organizations came together at Port Ludlow to shape the "Shared Strategy" for salmon recovery.

Headed by William Ruckelshaus, the first administrator of the Environmental Protection Agency under President Nixon, Northwest Indian Fisheries Commission Chairman Billy Frank, Jr., and former Washington Governor and U.S. Senator Daniel J. Evans, the Shared Strategy for Puget Sound was formed to, “develop a recovery plan for the Puget Sound region that meets the needs of fish and people.”

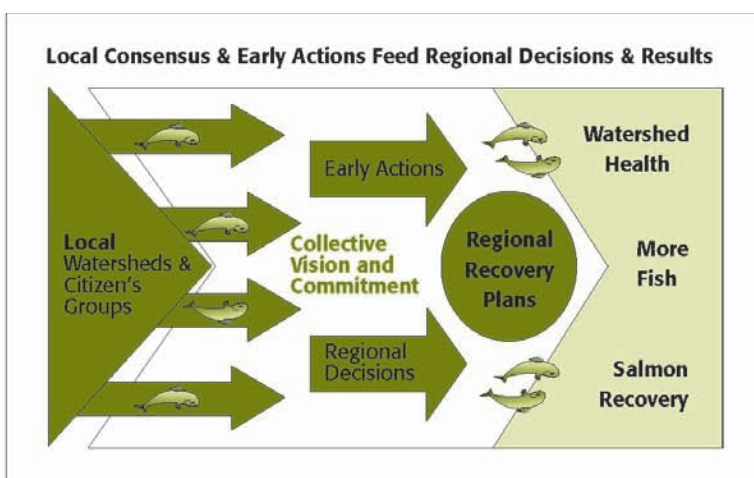
Knowing that a recovery plan is mandated by the ESA listing, the Shared Strategy effort was motivated, in part, by the desire to have local and regional communities that have been involved in salmon protection and restoration, and that would be responsible for implementing the actions needed to achieve recovery goals, prepare the Puget Sound Salmon Recovery Plan.

More than that, people involved in salmon efforts across the Sound wanted the ability to tailor recovery strategies and actions to the political, cultural, economic and ecosystem needs of individual watersheds across the Sound. They wanted to ensure that the plan would provide for economically viable fisheries, forestry, and agricultural industries. Furthermore, they wanted to place salmon recovery in the context of contributing to overall ecological benefits for other species and the marine environment. Thus the Shared Strategy process was designed to meld ESA requirements with locally-driven recovery efforts and a vision for the future of the region.

The federal agencies responsible for administering the Endangered Species Act (NOAA and USFWS) agreed to support this effort and have been active participants in the Shared Strategy process from the beginning.

### **Watershed and Salmon Recovery Planning Areas**

The Shared Strategy is based on the conviction that people in Puget Sound have the creativity, knowledge and resources to find lasting solutions to complex ecological, economic and community chal-



**Figure 1.4**

lenges. Watershed groups that represent diverse communities are considered to be essential to the success of salmon recovery.

For administrative and water resource planning purposes, the Washington Department of Ecology has divided the State of Washington into a number of Water Resource Inventory Areas (WRIA's) based on watershed/topographic boundaries rather than political units. Most salmon recovery planning groups are roughly organized along these lines as well. Considerable variety exists among the fourteen watershed planning areas such as urban and rural differences, precipitation, water quality and quantity, shoreline development, and topographic characteristics, but each of the areas contains committed groups working on salmon recovery. It is the goal of participants in the Shared Strategy process to protect and restore these fourteen major watershed areas, and in combination with cross-watershed actions, have them cumulatively add up to regional recovery.

### **Functions of the Shared Strategy Organization**

Shared Strategy leaders believe that effective stewardship occurs only when all levels of government coordinate their efforts in support of activities at the appropriate local or regional scale to protect and restore salmon runs. The preparation of the recovery plan has had the close involvement of federal, state, tribal and local governments along with watershed groups to develop technically sound so-



lutions that communities can embrace. (See chart of roles and responsibilities below.) Three functions of the regional organization were identified for the Shared Strategy at the onset of the preparation of the recovery plan, and have helped to guide the recovery planning process throughout.

### **1. Link existing federal, state, and tribal programs at the regional level.**

Preparation of a regional strategy and future implementation of the recovery plan depends on the integration of recovery efforts between governments throughout the Puget Sound region. The close communication of efforts such as hatchery reform, water quantity planning, growth management and salmon restoration has enabled the participants to take advantage of common data bases, assessment tools, and share strategic concepts, and is intended to avoid duplication of effort as the recovery plan is implemented.

### **2. Build the participation, capacity and commitment of watershed groups and local jurisdictions to plan and implement salmon recovery.**

One of the primary assumptions of the Shared Strategy has been that the efforts of people in the watersheds across Puget Sound are the fundamental building blocks for a recovery plan and its successful implementation, and that participation from every watershed is necessary to achieve recovery. Watershed residents are most directly aware of the conditions in their river systems and shorelines, and are being asked for commitments to carry out the recovery actions.

### **3. Provide coordination to the regional effort to prepare and facilitate decisions to implement the plan.**

The third function of the Shared Strategy organization has been to provide a forum for the region as it moves through plan preparation toward implementation, ensuring that appropriate scientific technical information is melded with community participation and policy judgments. Scientists from federal, state, tribal and local governments participated on a Technical Recovery Team appointed by

NOAA, and met with regional policy-makers and community watershed groups throughout the planning process. Additionally, regional administrators from NOAA and representatives from the Governor's Salmon Recovery Office participated consistently at regional forums and provided outreach and assistance to community groups throughout plan development.

## **Steps in the Preparation of the Regional Plan**

In 2002, the Shared Strategy Development Committee identified five main steps to build the information base and technical and policy decision making processes for preparing the Puget Sound Salmon Recovery Plan.

### **Step 1. Determine recovery plan content and assess current efforts.**

Efforts to outline the essential elements of the plan occurred in consultation with the National Marine Fisheries Service, US Fish and Wildlife Service, State of Washington, Puget Sound tribes, local governments, watershed councils and marine resource groups. The Puget Sound Technical Recovery Team (PSTRT) prepared guidelines for watershed groups outlining the technical information they felt would be required to determine whether the salmon populations could achieve recovery (PSTRT, 2003). The Washington Department of Fish and Wildlife (WDFW) prepared a broader outline for a Salmon Recovery Plan which incorporated elements from state watershed planning legislation and the Northwest Power Planning Council guidelines.

While the WDFW originally intended the outline to meet the requirements of the regional recovery plan required under the ESA, it became clear early in the process that planning guidance was most needed at the watershed level. Accordingly, the final Salmon Recovery Plan Outline (WDFW, 2003) contained a detailed list of technical and policy questions for watershed groups to consider during plan preparation. The WDFW version of the plan outline was approved by the regional director of NMFS in a letter on January 22, 2004. The

## Shared Strategy for Puget Sound

### Roles and Responsibilities During Recovery Plan Preparation

- **Watershed Groups/Local Governments:** Groups such as watershed councils, regional fish enhancement groups, lead entities for salmon recovery, watershed planning units and other community resource groups have been involved in preparing recovery plans for their watersheds. Local and tribal governments have helped coordinate these efforts and provided substantial technical assistance. Key functions have been to assess historic, current and potential future conditions of fish and watershed resources, identify and prioritize protection and restoration actions, and prepare timelines and cost estimates.
- **Puget Sound Technical Recovery Team (PSTRT):** Appointed by NOAA, this panel of 7 scientific experts from federal, state, local and tribal organizations has developed the scientific framework and ESU recovery criteria at the regional level; developed planning ranges for Chinook populations; and has provided technical guidance to watershed and regional groups in preparing watershed recovery chapters and regional elements of the plan.
- **State and Tribal Co-Managers:** Puget Sound tribes and the Washington Department of Fish and Wildlife have been actively involved in the preparation of comprehensive harvest management plans and hatchery genetic management plans for listed species across the region; worked toward the integration of habitat, harvest and hatchery considerations in the watershed and regional level chapters of the recovery plan; participated in habitat restoration activities, and developed recovery target numbers for Chinook salmon.
- **Shared Strategy Development Committee:** This successor group to the leaders who formed the Shared Strategy for Puget Sound in 1999 have provided overall direction for the Shared Strategy approach to recovery planning, resolved policy issues, and have served as ambassadors to constituent groups, local government, watershed groups, legislators and Congress. Comprised of community leaders and representatives from federal, state, tribal and local governments, as well as business, agricultural and environmental groups, these individuals bring different perspectives to the table for discussion in the recovery planning process.
- **Shared Strategy Work Group (agency policy staff) and regional staff:** Staff activities have focused on the organization's objectives to provide outreach and support to watershed groups, link various recovery activities, and provide the policy analysis, strategy advice and logistical support necessary for plan preparation.

collaborating agencies extended considerable support to the local watersheds during plan development.

#### **Step 2. Determine regional recovery criteria and targets and ranges for each watershed.**

The guidelines for recovery plans under the Endangered Species Act require the preparation of quantifiable recovery goals for the species listed, as a benchmark in measuring the progress toward recovery. Regional recovery guidelines and planning ranges for Puget Sound Chinook populations were developed by the Technical Recovery Team (PSTRT,

2002). Planning targets for Chinook were prepared by state and tribal co-managers using a variety of computer models. Watershed planning groups used this information to prepare their local recovery chapters. Goals for Hood Canal summer chum and bull trout have been developed by federal, state and tribal biologists working on these species.

#### **Step 3. Develop local watershed recovery chapters.**

At the start of the Shared Strategy initiative local watershed planning groups had the opportunity to voluntarily join the regional effort and have their

local recovery plans incorporated into the Puget Sound-wide plan. In the end, all fourteen planning areas agreed to participate. To meet ESA recovery plan requirements, they were asked to prepare chapters to identify the threats to salmon survival and specify restoration and protection strategies and actions addressing the factors for decline. Following PSTRT guidance, the planners developed working scientific hypotheses to relate watershed conditions to their effects on the species, and prepared detailed action plans with timelines, costs and in some cases a beginning set of commitments for implementation. Local and regional agencies and state and tribal fisheries co-managers were also requested to integrate habitat, harvest and hatchery actions affecting listed species in each watershed area.

Individual draft watershed chapters were submitted to the PSTRT, the Shared Strategy Work Group and staff by watershed planning groups on June 30, 2004. An extensive technical and policy review process occurred from July 2004 to September 2004. Watershed planners revised their chapters according to the feedback received during the review to the extent possible given the various states of knowledge and political support in their respective areas. They submitted updated chapters for inclusion in the regional plan in April and May, 2005.

In May 2005, the PSTRT and an interagency policy committee facilitated by the Shared Strategy staff conducted another round of technical and policy reviews of watershed chapters. The PSTRT reviewed the plans from a technical perspective to determine the degree of certainty that they can achieve their stated recovery goals. Together the PSTRT and policy team looked at how well the plans met ESA recovery plan requirements. The analysis from the review was used to summarize strengths and significant proposals as well as decisions underway, possible gaps and recommend ways to close the gaps to increase the certainty of success and meet ESA plan requirements.

Individual watershed plans are summarized in profiles in Chapter 5. The results from the review are also included at the end of each watershed profile.

#### **Step 4. Build regional strategies and commitments.**

In addition to the individual watershed chapters (Volume II of this plan), Shared Strategy participants identified a number of cross-watershed issues that will need to be addressed at the regional, state and federal levels in addition to the individual watershed level. These include water resource issues (water quality and water quantity), forestry and agricultural programs, habitat protection measures and tools (voluntary and regulatory), nearshore-marine protection and restoration strategies, a financing strategy and implementation functions.

Initial ideas for how to approach these topics were presented at the 2005 Shared Strategy Summit attended by over five hundred people representing the diversity of interests related to salmon recovery. Summit participants provided input on how to advance these approaches. Following the Summit, groups with members having policy or scientific expertise and an interest in the topics further refined them.

The May 2005 review also assessed the degree of certainty that the combined local and regional elements in this plan can meet the PSTRT regional recovery criteria and meet ESA recovery plan requirements. Some of the same cross-watershed issues listed above emerged as needing more focus and attention to increase the certainty of achieving plan outcomes and contributing to overall ESU-scale recovery. (It is the Puget Sound Evolutionarily Significant Unit or ESU that is listed as threatened under the Endangered Species Act and not the individual Chinook populations.) The review conclusions and recommendations were used to complete the plan, including identifying strategies for closing identified gaps and ensuring that the plan meets ESA plan requirements under section 4(f).

Issues that are common to multiple watersheds



as identified during the 2005 review by the Puget Sound Technical Recovery Team as well as those requiring attention and action by other levels of government are described in Chapter 6: Regional Strategies, in Chapter 7: Adaptive Management and Monitoring and in Chapter 9: Financing Strategy.

#### Step 5. Finalize and submit the regional plan.

The objective of Step 5 was to finalize recovery strategies and actions for Puget Sound that are consistent with the requirements of the Endangered Species Act, treaty rights, and the goals and objectives of state and local governments and watershed planning groups. The May 2005 review process “rolled up” the various watershed chapters and regional elements to assess how the combined parts of this plan add up to meet the PSTRT recovery criteria. These roll-up conclusions can be found in *Chapter 5: How Does It All Add Up Into One Plan? Regional Results*.

The Shared Strategy Development Committee received a briefing on the watershed and regional plan elements and the May 2005 review conclusions and recommendations. They proudly agreed to submit the Draft Puget Sound Salmon Recovery Plan to the federal agencies (NOAA and USFWS) on schedule on June 30, 2005. The attached trans-

mittal letter describes the conditions of the submittal.

### The Draft Puget Sound Salmon Recovery Plan

Under the Endangered Species Act (ESA), a recovery plan must have quantitative recovery criteria and goals, identify threats to survival, site specific management strategies and actions necessary to address the threats, cost estimates of the actions and a schedule for implementation. A monitoring and adaptive management program should also be included. The May 2005 review process concluded that this draft plan meets the ESA recovery plan requirements under section 4(f).

As the vision and goals section points out, Shared Strategy participants aspire to more than the minimum requirements of the ESA. They wish to create a future in which both people and salmon co-exist and thrive. They know that salmon recovery is a long-term prospect. Achieving recovery involves coordinating and integrating many parts such as harvest and hatchery management and habitat restoration and protection. Many people and organizations need to work together in a coordinated way over time to succeed. Meanwhile, scientists must continue to research and learn more about salmon and their needs and the ecosystems which

they share with other species, including humans. In the future, new opportunities may open up for adding to recovery actions that may not be available or apparent today. All this is to say that salmon recovery has to be viewed as a dynamic and evolving initiative.

The plan lays out long-term recovery goals and strategies, but its primary focus is on the next ten years of actions to place this region on a path toward recovery. This is because its ultimate success depends upon the various authorities and responsible parties stepping up to commit to implement the strategies and actions described in the plan. A ten-year timeframe

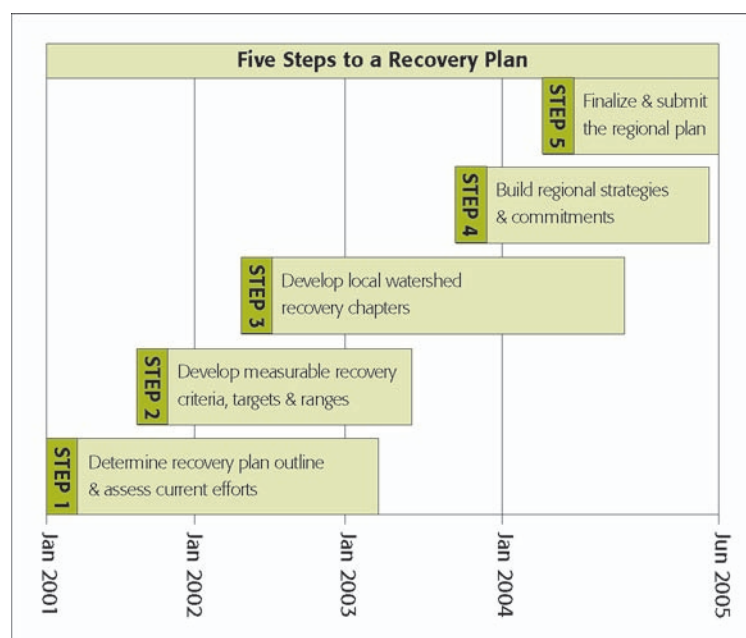


Figure 1.5

is a reasonable period of time to ask for commitments and begin to see progress and results. Shared Strategy leaders are committed to continue to build the needed commitments throughout the rest of 2005 and beyond to implement the first ten year's of actions. Shared Strategy participants hope that the first ten years will put the region on a solid recovery path and demonstrate to future leaders and decision-makers in years eleven and beyond that they should continue to support recovery activities.

This recovery plan recognizes the dynamic and evolving nature of salmon recovery. It should be read and understood as a living document. Strategies and actions in this plan will make significant progress in the next ten years to benefit all of the remaining 22 populations of Chinook. While this plan will improve conditions for the salmon and meets the ESA recovery plan requirements, it does not claim to have all the answers nor to solve all the chronic problems and threats affecting the species. It does however, identify the threats and issues needing to be addressed, identifies at least preliminary approaches for dealing with them and has a schedule for making progress on those issues for which there are no easy answers. It also lays out the framework for a monitoring and adaptive management program with details to be developed through the summer and fall of 2005 in time for the federal register notice and public review process.

Shared Strategy participants believe that this plan, if implemented, will put the region on a significant path toward recovery of the species in the next ten years. Through the on-going efforts described in the above paragraphs, Shared strategy participants also believe that these first ten years of actions will position the region to build long-term support for salmon recovery.

### **What happens next after submittal?**

Following the submission of this document by the Shared Strategy to the National Marine Fisheries Service and the US Fish and Wildlife Service, the Services will conduct a review of the document and initiate a comprehensive public review process. Final adoption is expected in late December 2005.

# Benefits of Salmon Recovery for Biodiversity and Ecosystem Health

## Introduction

The Puget Sound ecosystem encompasses a wide range of freshwater, marine, and terrestrial environments that sustain a diverse array of species. The Shared Strategy process has resulted in a series of recommendations to help protect three of our region's species that are listed under the Endangered Species Act—the Puget Sound Chinook salmon, Hood Canal summer chum salmon, and bull trout. During this same period, The Nature Conservancy, the Washington Department of Fish and Wildlife, and others, completed an extensive eco-regional assessment for an area known as the Willamette Valley-Puget Trough-Georgia Basin (WPG) eco-region, which includes a portion of the Puget Sound ESU (Floborg et al., 2004). This mutual effort provides an opportunity to qualitatively assess the benefits of the Salmon Recovery Plan for overall biodiversity of the region.

The WPG Eco-regional Assessment is a comprehensive conservation analysis of the region's terrestrial, nearshore, marine, and freshwater biodiversity. Relying on the best available biological information as well as

information on human impacts, the assessment quantifies the biodiversity of the region and identifies which geographic areas are most important for the conservation of existing biodiversity. As a result, in those areas where they overlap, the WPG assessment complements the recovery plan's salmon habitat assessments.

The eco-regional assessment found that relative to its size, the Willamette Valley-Puget Trough-Georgia Basin eco-region has a large number of species that are imperiled,



Photo by Dan Kowalski.



declining, or of conservation concern. There are also a number of nearshore, terrestrial, and freshwater ecological systems that are at risk. In the Georgia Basin-Puget Trough portion of the eco-region, the assessment identified over 250 species targets that are imperiled, declining, or of conservation concern (Floberg et al., 2004). These findings point to some troubling trends in the overall health of this ecosystem.

The Puget Sound salmon recovery plan will be implemented within the context of this complex ecosystem. The plan proposes a wide range of recovery actions that will be implemented throughout the Puget Sound basin—from nearshore areas to the upper reaches of the watersheds. While the recovery plan is necessarily focused on listed salmon species, it is logical to also ask the question, “In what ways will the recovery plan benefit the overall health of the ecosystem and the breadth of biodiversity in the region?” This section of the plan explores that question and discusses ways in which recovery actions may benefit other species as well as the overall health of the Puget Sound ecosystem.

### **Role of salmon in Puget Sound watershed ecosystems**

Over the past few decades, there has been a growing consensus in the scientific community about the crucial role that salmon play in supporting and maintaining ecosystem health. It has become clear that many ecological processes of our watersheds (including those that shape the land, control water flow and content, and govern biological activity) have evolved with and depend on salmon.

Because of their important role in supporting the ecosystem, salmon have been identified as a “keystone species” (see Willson and Halupka, 1995).



Photo courtesy the Dungeness River Management Team

A keystone species is a species whose impact on a biological community or ecological system is disproportionately large compared with their abundance. Keystone species contribute to ecosystem function in a unique and significant manner through their regular activities. Removal (or decline) of these species can cause fundamental changes in the ecological system.

To illustrate the importance of salmon in Northwest ecosystems, it is useful to consider the role that salmon play in: 1) cycling of nutrients in watersheds; and 2) ecological/wildlife interactions.

### **Nutrient cycling**

Research shows that salmon populations are critical in transferring energy and nutrients inland from the Pacific Ocean to aquatic and terrestrial ecosystems. Spawning salmon provide a source of carbon, nitrogen, and phosphorous that is essential to maintaining the production of juvenile salmon and other animals in the watershed’s food web. Riparian forests, which are important habitat to many wildlife species, benefit directly from the nutrients that salmon provide (Mathewson et al., 2003).

Through this nutrient cycling function, anadromous salmon play a key role in maintaining an ecosystem’s productivity (Cederholm et al., 2000). For example, introduction of salmon carcasses in



Photo by Dan Kowalski.

a stream has been shown to increase the density of certain macroinvertebrates. Macroinvertebrates feed on adult salmon carcasses and then are in turn eaten by juvenile salmon, providing an important food source that supports the growth and survival of salmon in the early stages of their life cycle (Cederholm et al., 2000).

A recent study found, however, that due to declining salmon runs, the rivers of Puget Sound, the Washington coast, and the Columbia River are receiving only 3% of the marine-derived organic matter that was once delivered to those rivers by anadromous salmon (Gresh et al., 2000).

### **Ecological relationships-salmon/wildlife interactions**

A growing body of research shows the important interplay between salmon and other wildlife populations. The various life stages of salmon (i.e., eggs, fry, smolts, adults, and carcasses) all provide direct or indirect foraging opportunities for a variety of terrestrial, freshwater, and marine wildlife (Cederholm et al., 2000).

Anadromous fish (including their eggs) are a major source of high-energy food that allows for successful reproduction and enhanced survival of adults and juveniles of many wildlife species. They also provide support for long-distance migrant birds (Cederholm et al., 2000). For example, the Skagit River system, which has the highest populations of all five salmon species in Puget Sound, is a critically important winter feeding area for migrating bald eagles. As many as 580 bald eagles have been observed in the Skagit River watershed in recent winters feeding on the carcasses of spawning chum, pink and other salmon species.

Johnson et al. (in prep.) examined the relationship between salmon and 605 species of wildlife in Oregon and Washington. The study found 137 species of birds, mammals, amphibians and reptiles that are predators or scavengers of salmon at one or more stages of the salmon life cycle. Of this total, nine species were found to have strong-consistent relationship with salmon. These include the bald eagle, American black bear, Caspian tern, common merganser, grizzly bear, harlequin duck, killer

whale, osprey, and river otter. Fifty-eight species were found to have a recurrent relationship with salmon.

Johnson et al. (in prep.) also showed how these nine species with a strong-consistent relationship with salmon are found in many different habitat types. These nine species not only inhabit freshwater and marine habitats, but also occur across a range of inland forest, woodland, shrubland, and grassland habitats. In this way, salmon support ecological functions that extend beyond just salmon-inhabited aquatic systems.

Cederholm et al. (2000) concluded that the loss or severe depletion of anadromous fish stocks could have major effects on the population biology (i.e., age class, longevity, dispersal ability) of many species of wildlife, and thus on the overall health and functioning of natural communities over much of the region. Conversely, as the health of salmon populations improves, one would expect to see improvements in populations of many of the associated wildlife species as well.

### **How the recovery plan supports biodiversity and ecosystem health**

Given the important role that salmon play, how will the recovery plan support the region's biodiversity and the overall health of the ecosystem?

#### **Watershed-level analysis**

First, it is important that the recovery plan is built around watershed-level analysis.

Watersheds are also an appropriate scale for evaluating freshwater ecosystem conservation needs, since freshwater organisms depend on the health and integrated processes of the contributing watershed. Around the world, freshwater-dependent animals, such as mussels, crayfishes, stoneflies, amphibians, and fish, are the species most vulnerable to extinction (Stein et al., 2000). It is estimated that the rate of extinction for freshwater species is five times greater than the rate for terrestrial species (Ricciardi and Rasmussen, 1999). As more and

more public and private conservation efforts are focused on freshwater systems, it will be extremely helpful to make linkages between freshwater and salmon conservation planning efforts.

The Willamette Valley-Puget Trough-Georgia Basin Eco-regional Assessment, which did not explicitly analyze salmon habitat, identified a pressing need to integrate salmon-related data into its analysis in order to develop a more comprehensive and coordinated approach to identifying areas of significance for freshwater biodiversity. Subsequent freshwater assessments conducted by The Nature Conservancy have incorporated salmon and have been conducted in a watershed context. The recovery plan's watershed-level of analysis will help facilitate further linkages between salmon recovery planning and freshwater biodiversity planning.

### **Ecological functions and processes**

The recommendations in the recovery plan, if carried out, offer another significant benefit to biological diversity: a focus on the need to maintain and restore ecological processes and services. Maintaining instream flows, restoring riparian habitat and estuarine habitat, removing fish passage barriers, opening up off-channel and floodplain habitat, reducing sediment loading—all of these actions will help restore ecological processes that are essential to freshwater, terrestrial, and marine species and systems.

One aspect of restoring natural processes to watersheds is allowing for some level of natural disturbance (i.e., flooding, landslides, etc). Recovery actions which allow for a greater degree of natural disturbance within watersheds should result in more diverse habitat types which, in turn, will help support a higher diversity of plant and animal species.

Recovery actions will also help restore biological integrity to Puget Sound watersheds. Watersheds with a high degree of biological integrity have the ability to support and maintain a balanced, integrated and adaptive assemblage of organisms



having species composition, diversity, and functional organization comparable to that of natural habitat of the region (Karr and Dudley, 1981).

### **Habitat restoration**

Salmon occupy a variety of habitats during their life cycle. The recovery plan addresses the limiting factors for salmon recovery for each of these life cycle stages and habitat types. Given the diversity of habitats that salmon require, recovery actions should benefit a broad array of species that rely on these diverse habitats.

Restoration actions in riparian areas will be especially helpful to other species. Research shows that 393 of 456 (86%) of the common terrestrial, and freshwater wildlife species in Oregon and Washington use riparian areas, wetlands, and streams during some season or part of their life cycle. Of these 393 species, 110 were found to be closely associated with riparian habitat types (Johnson et al., in prep.).

In particular, mainstem channels are essential components of biodiversity and have a high degree of species richness. Some listed species-Chinook salmon in particular-are mainstem dependent. Because the development footprint is most intense around mainstem rivers in Puget Sound, recovery actions that improve mainstem conditions will benefit many other species as well.

A number of the watershed plans have identified estuary protection and restoration as high priorities. Estuaries are highly productive nurseries, supporting juvenile fish, shellfish, and large numbers of migrating birds. The region has lost over 70% of its estuarine habitat to diking, filling, and dredging. Restoring estuarine habitats will result in significant benefits to a wide range of species. Many of the 40 Puget Sound species that are listed as threatened or endangered rely on nearshore and estuary habitat for at least part of their life cycle.



### **Nutrient dynamics**

As recovery actions are implemented, there is a significant potential to enhance the flow of energy and nutrients into freshwater and estuarine food webs. If salmon populations are recovered to viable populations, one should expect a positive, and in some cases very significant, impact on nutrient dynamics in Puget Sound watersheds. Restoration of healthy nutrient dynamics will have ripple effects throughout the ecosystem, benefiting a variety of other species.

For example, Munn et al. (1999) considered changes in nutrient loading, cycling, and ecosystem productivity that could result from restoration of historic salmonid populations to the Elwha River system if the river's two dams are removed. The study indicates a potential 65-fold increase in nitrogen and phosphorous loadings from salmon returns. They concluded that restoration of the Elwha River system salmon runs would have a profound effect on the productivity of the ecosystem.

### **Wildlife interactions**

Restoring viable populations of listed salmon stocks will result in additional fish spawning and rearing in the various watersheds. Additional numbers of fish will directly benefit the 67 wildlife species discussed above that have either strong-consistent or recurrent relationships to salmon (Johnson, in prep.).

## Conclusion

Local watersheds have identified a range of actions that will contribute to the recovery of listed salmon stocks. These actions will have a direct and demonstrable effect on salmon habitat, but they will also help restore and improve a range of habitats, species, and ecosystem processes. Although the recovery plan is salmon-focused, the proposed actions will benefit many native species and natural communities. Over time, these actions should improve the overall health of the Puget Sound ecosystem.

In order to maximize the salmon-biodiversity benefits described above, local watersheds should be encouraged to evaluate salmon recovery priorities along with the biodiversity conservation priorities identified in the Willamette Valley-Puget Trough-Georgia Basin (WPG) eco-regional assessment. This assessment provides useful information to determine how areas identified as priorities for salmon would contribute to the larger biodiversity of the region. In many cases, protection of top-priority biodiversity sites may also benefit salmon stocks. By integrating salmon conservation priorities with the multi-species assessment in the WPG report, it may be possible to leverage recovery actions to achieve even greater benefits for the biodiversity of the region.

# Endangered Species Act Listing and Related Mandates

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*"The purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate...."*

*The Endangered Species Act of 1973*

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In 1994, following several petitions to list West Coast Salmon and Steelhead as threatened or endangered under the Endangered Species Act, the National Marine Fisheries Service (NMFS) convened Biological Review Teams to undertake comprehensive scientific reviews of Chinook, coho, chum, sockeye and pink salmon, as well as steelhead and cutthroat trout in Washington, Oregon, California and Idaho. These status reviews were used to identify "evolutionarily significant units" (ESUs) of salmon and steelhead, and to evaluate whether any of the identified ESUs should be listed as threatened or endangered (see definitions). Petitions to list bull trout as an endangered species were submitted to the U.S. Fish and Wildlife Service (USFWS) in 1992, including the "distinct population segment" of Coastal/Puget Sound bull trout.

In the Puget Sound region, the NMFS Biological Review Teams determined that two ESUs are sufficiently at risk to be classified as "threatened species", i.e. Puget Sound Chinook and the Hood Canal summer run of chum salmon. Coho salmon in the Puget Sound/ Strait of Georgia ESU were considered a "species of concern" but actual listing under the Act was not considered to be warranted at this time. In 1999, bull trout recovery teams convened by the USFWS determined that listing of bull trout as "threatened" throughout its range in the coterminous United States was needed.

## **Listing History for Puget Sound Chinook**

West Coast Chinook salmon have been the subject of numerous Federal Endangered Species petitions for listing beginning with an action to list the Sacramento River winter-run Chinook, which was filed by the American Fisheries Society in 1985. Following several more actions and petitions related to the Sacramento River, Snake River and Columbia River, the National Marine Fisheries Service was petitioned by the Professional Resources Organization-Salmon (PRO-Salmon) on March 14, 1994 to list various populations of Chinook in Washington State. On September 12, 1994, NMFS indicated that the PRO-Salmon

### **Status Reviews under the Endangered Species Act**

NMFS follows three steps in making listing determinations:

1. NMFS determines whether a population or group of populations constitutes an Evolutionarily Significant Unit; i.e. should be considered as a "species".
2. NMFS determines the biological status of the ESU and the factors that have led to its decline.
3. NMFS assesses efforts being made to protect the ESU and determines whether, in light of those efforts, the statutory listing criteria are satisfied.



petition contained substantial information that action may be warranted, and announced that it would commence a coast-wide status review of all West Coast Chinook salmon.

A Biological Review Team (BRT) comprised of scientists from the NMFS Northwest, Southwest, and Auke Bay Fisheries Science Centers, and the National Biological Survey completed a coast-wide review in December, 1997, which was updated in 2003 (NMFS/BRT, 1997 and 2003). The Team concluded that West Coast Chinook salmon were grouped into 17 Evolutionarily Significant Units based on genetic data, differences in where the salmon migrate, age at which the Chinook mature, run timing, and geographic and environmental characteristics. Of these 17 Chinook salmon ESUs, eight did not warrant listing under the Endangered Species Act, seven were considered to be threatened (including the Puget Sound ESU) and two are listed as endangered.

A proposed rule for the listing of Puget Sound Chinook and three other Chinook ESUs as threatened was published in the Federal Register on March 9, 1998, and a Final Determination was issued on March 24, 1999. A chronology of the major listing notices and related actions is located at the end of this section. During the year between the proposed rule and the final determination, NMFS conducted 21 public hearings within the range of the proposed Chinook salmon ESUs in California, Oregon, Washington and Idaho. A summary of the comments on the proposed rule and the NMFS response is included in the Final Determination (Federal Register; March 24, 1999).

In the years following the 1998-1999 rule process, additional scientific information on the status of Chinook populations and legal proceedings related to the determination of hatchery-produced fish necessitated an update to the rules listing Puget Sound Chinook and other threatened ESUs. NMFS issued a proposed rule to list these ESUs on June 14, 2004.

## Listing History for Hood Canal Summer Chum and the Chum Status Review

Listing for Hood Canal summer chum closely corresponded to the process for Puget Sound Chinook. The 1994 petition filed by PRO-Salmon included

### Some Definitions Used under the Endangered Species Act

For purposes of the Endangered Species Act, a **“species”** is defined to include “any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.”

**Distinct Population Segment:** A population is considered distinct (and hence a “species” for purposes of conservation under the Act) if it is discrete from and significant to the remainder of its species based on factors such as physical, behavioral or genetic characteristics, it occupies an unusual or unique ecological setting, or its loss would represent a significant gap in the species’ range.

The National Marine Fisheries Service uses the term **“Evolutionarily Significant Unit” (ESU)** to describe a distinct population segment of Pacific salmon that:

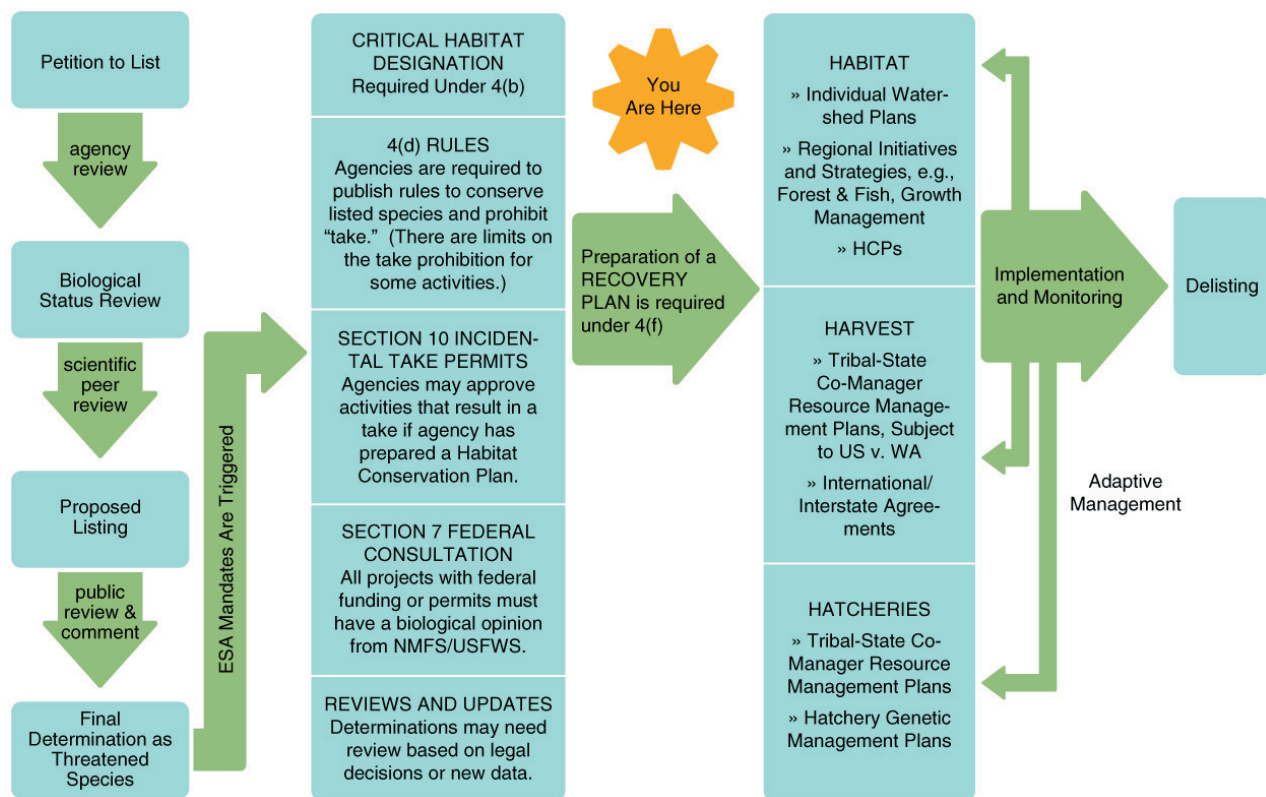
1. is reproductively isolated and
2. represents an important component in the evolutionary legacy of the species.

To evaluate these criteria, scientists look at the following questions:

- Is the population genetically distinct?
- Does the population occupy unique habitat?
- Does the population show unique adaptation to its environment?
- If the population became extinct, would this event represent a significant loss to the ecological/genetic diversity of the species?

The term **“endangered species”** means any species or distinct population segment which is in danger of extinction throughout all or a significant portion of its range.

The term **“threatened species”** means any species or distinct population segment which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.



**Figure 1.6 A simplified overview of the ESA listing process for Puget Sound Chinook, and Coastal/Puget Sound Bull Trout.**

Hood Canal summer chum, and a status review for all West Coast chum salmon was initiated September 12, 1994. A total of four evolutionarily significant units (ESUs) were identified by the Chum Biological Review Team in 1997, of which the Hood Canal summer chum and the Columbia River chum ESUs were considered to be at risk of becoming endangered. The declining trend of Hood Canal summer chum and extremely low run sizes in several streams were cited as reasons for the proposed listing, which was issued on March 10, 1998. A final determination to list Hood Canal summer chum as threatened was published in the Federal Register on March 25, 1999. Hood Canal summer chum were also included in the proposed rule to list several West Coast ESUs on June 14, 2004, which constituted an update of previous listings.

### **Listing for Coastal/Puget Sound Bull Trout**

Bull trout fall under the jurisdiction of the U. S. Fish and Wildlife Service (USFWS), and have

followed a slightly different pathway and timeline for the listing process. On October 30, 1992, the USFWS received a petition to list bull trout as an endangered species throughout its range from the Friends of the Wild Swan, Alliance for the Wild Rockies, and the Swan View Coalition. The USFWS published a determination in 1993 that the petitioners had provided substantial information indicating that listing may be warranted but that it was precluded by other higher priority work. A number of legal challenges to this finding ensued, and on December 4, 1997 the Oregon Federal District Court ordered the USFWS to determine whether listing of the Coastal-Puget Sound distinct population segment was warranted, among other actions. The Coastal-Puget Sound bull trout are one of the five distinct population segments which collectively encompass the entire range of the species in the coterminous United States. Bull trout recovery teams were convened by USFWS in early 1999, and a final rule was published on November 1,

## Critical Habitat

“Critical Habitat” is defined in the Endangered Species Act as, “the specific areas within the geographical area occupied by the species... on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection.” Essential features of critical habitat include adequate

- Substrate
- Water quality
- Water quantity
- Water temperature
- Water velocity
- Cover/shelter
- Food
- Riparian vegetation
- Space
- Safe passage conditions

Freshwater and estuarine habitat includes riparian areas that provide the following functions: shade, sediment transport, nutrient/chemical regulation, streambank stability, and input of large woody debris or organic matter.

1999 to list all bull trout in the coterminous United States as threatened. A draft recovery plan for the Coastal-Puget Sound Distinct Population Segment was issued by the USFWS in May, 2004.

### ESA Mandated Actions Following Listing

The final determination of species as threatened initiates a number of procedures and requirements under the Endangered Species Act, including the designation of critical habitat, regulations governing take, Federal consultation on actions affecting the threatened species, preparation of a recovery plan, and monitoring.

### Designation of Critical Habitat

The Endangered Species Act requires designation of critical habitat at the time a species is listed, unless the Secretary of Commerce/Interior deter-

mines that the designation would be detrimental to the species' continued existence or that the limits of critical habitat are not determinable. In designating critical habitat, agencies consider the species' requirements including space for individual and population growth; food, water, air, light, minerals or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction or rearing offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distribution of the species.

### Puget Sound Chinook

In the proposed Rule (March 9, 1998) to list the Puget Sound Chinook ESU as threatened, NMFS generally described the areas that constitute critical habitat to include all marine, estuarine and river reaches accessible to Chinook salmon in Puget Sound. A designation was published on February 16, 2000 which indicated that critical habitat encompassed dozens of major river basins and an array of essential habitat types, including juvenile rearing areas, juvenile migration corridors, areas for growth and development to adulthood, adult migration corridors and spawning areas. In April, 2002 NMFS withdrew the designation in order to incorporate an economic analysis of the designation and obtain additional public and technical input. A revised Critical Habitat Designation for Puget Sound Chinook was published in the Federal Register on December 14, 2004 and NMFS took public comment until March 14, 2005. A final rule is scheduled to be issued on or before August 15, 2005.

### Coastal/Puget Sound Bull Trout

Following the 1999 listing of bull trout as a threatened species, the USFWS found that the designation of critical habitat for the Coastal-Puget Sound Population and other population segments was “not determinable.” This was due to the lack of sufficient information about the biological requirements of bull trout that would be needed to identify areas as critical habitat. Additionally, the USFWS



## Habitat Conservation Plans Approved or in Development in Puget Sound:

### Plans Approved:

- City of Seattle (upper Cedar River Watershed) approved 4/21/00.
- City of Tacoma (upper Green River City Watershed) approved 7/9/01.
- WA Dept Natural Resources (forest mgmt activities on state-owned timberlands) approved 1/30/97.
- Green Diamond Timber (forest mgmt activities Shelton-area) approved 10/12/00.
- Plum Creek Timber (forest mgmt activities upper Green River and I-90 corridor) approved 6/27/96.

### HCPs in Development (as of April, 2005; which may or may not proceed to a permit-issuance decision):

- Forest Practice HCP (forest activities on all commercial private forest lands under State regulations).
- WA Dept Natural Resources (various activities on state-controlled aquatic lands, freshwater and sub-tidal).
- King County Wastewater Treatment Division (operations of KCWTD within their service area).
- City of Kent (instream flows and City water operations on Rock Creek, trib to Cedar River).
- Sequim Dungeness Water Users Association (Dungeness River instream flows and water operations of the 7 local irrigation districts).
- Snohomish County Dept of Public Works (county road and stormwater mgmt in watersheds of 3 tribs to north Lake WA).
- City of Bellingham (water diversions in Nooksack River for City water supply).

lacked information about the number of individuals and the amount or locations of spawning areas within rivers and streams required for viable populations of bull trout.

A number of legal actions were filed against the USFWS regarding the failure to designate critical

habitat for bull trout. On June 25, 2004, the USFWS published the proposed critical habitat designation for the Coastal-Puget Sound population of bull trout, which includes a total of 2,290 miles of streams in western Washington, along with 52,540 acres of lakes and reservoirs, and marine habitat paralleling 985 miles of shoreline. The proposal excludes properties where special management status for bull trout already exists, such as approved Habitat Conservation Plans and the Washington Forest Practice Regulations under the Forest and Fish Report. Hearings on the proposed critical habitat designation were held in July and August, 2004 and a final rule is anticipated by June, 2005.

## Other Endangered Species Act Mandates and Related Actions

### Publication of 4(d) Rules

Under section 4(d) of the Endangered Species Act, Federal agencies are, "required to adopt such regulations as are deemed necessary and advisable for the conservation of species listed as threatened." The National Marine Fisheries Service issued a proposed rule governing the take of salmon within seven salmon ESUs, including Puget Sound Chinook and Hood Canal Summer Chum, on January 3, 2000. A wide range of activities were prohibited in the proposed 4(d) rule that NMFS believes may injure listed salmonids, including water withdrawals, destruction of habitat (such as removal of large woody debris or dredging), land use activities adversely affecting habitat (such as logging, grazing, farming and urban development), pesticide and herbicide application, and introduction of non-native species. The final 4(d) rule for Puget Sound Chinook and Hood Canal summer chum was adopted in June, 2000.

Section 4(d) rules related to the taking of bull trout were generally included as part of the November 1, 1999 listing documents. The USFWS also filed a Notice of Intent to Prepare a Proposed Special Rule Pursuant to Section 4(d) to exempt additional habitat restoration activities and other

land and water management activities from the take prohibitions of the Act when they are conducted in accordance with enforceable regulations that provide protection for bull trout.

**Section 10 Permits:** Section 10 of the Endangered Species Act provides another mechanism for NMFS and USFWS to permit the taking of a threatened species when it is the incidental result of carrying out an otherwise lawful activity. Applicants for an “Incidental Take Permit” must submit a “Habitat Conservation Plan” that identifies the impacts expected from any take associated with the proposed activities, and the steps that will be taken to monitor, minimize, and mitigate those impacts. A number of Habitat Conservation Plans have been approved or are in process.

**Federal Consultation:** Section 7 of the Act requires that Federal agencies consult with NMFS or the USFWS on activities they authorize, fund, or carry out to ensure they are not likely to jeopardize the continued existence of listed species or result in the destruction or modification of their critical habitat. This includes federally funded projects such as road construction, stormwater management, rural and urban development, and many other activities conducted, permitted, or funded by Federal agencies. NMFS and the USFWS have developed methods to determine whether proposed actions are likely to restore, maintain or degrade habitat (NMFS, 1996).

**Role of Hatchery Salmon in Listing Determinations:** Hatchery fish present potential benefits and risks to the biological status of salmon populations. In 1993, NMFS adopted an interim policy on how to consider artificially propagated fish in the listing and recovery of Pacific salmon and steelhead under the Endangered Species Act. In response to additional scientific research and legal actions, NMFS issued a revised policy in 2004, which is described further in Chapter 6, *Regional Hatchery Management Strategies*.

**Relationship of the ESA and the Rights of American Indian Tribes:** In recognition of the trust

**Section 4(f) of the Endangered Species Act requires the agencies to develop and implement plans for the conservation and survival of endangered species. Each plan is required to incorporate:**

- (i) “ a description of such site-specific management actions as may be necessary to achieve the plan’s goal for the conservation and survival of the species;
- (ii) objective, measurable criteria which, when met, would result in a determination.... that the species be removed from the list; and
- (iii) estimates of the time required and the cost to carry out those measures needed to achieve the plan’s goal...”

responsibility and treaty obligations of the United States toward Indian tribes and tribal members, the Secretaries of Interior and Commerce issued Secretarial Order #3206 on June 5, 1997 to clarify the responsibilities of the agencies while taking actions under the authority of the Endangered Species Act. The Order directed the departments to work directly with Indian tribes on a government-to-government basis to promote healthy ecosystems, recognized the unique legal status of Indian lands, and affirmed tribal management authorities and Federal consultation responsibilities in carrying out the conservation measures of the Act.

### **Recovery Plans**

Many of the same factors have contributed to the decline and limit recovery of Chinook, Hood Canal summer chum, and Coastal-Puget Sound bull trout, and many of the recovery actions are likely to benefit all of the distinct population segments that are threatened. Although recovery plans have generally been prepared by the federal agency of jurisdiction, studies have indicated that the broad participation of diverse participants in the development of

recovery plans increases the likelihood of successful plan implementation (Hatch et al. 2002). Accordingly, NMFS, USFWS, and state, tribal and local governments have determined the advisability of coordinating the regional recovery planning to meet the requirement of Section 4(f).

The USFWS has divided the Coastal/Puget Sound Bull Trout distinct population segment into two management units for recovery planning--Olympic Peninsula and Puget Sound. USFWS issued draft recovery plans for the two management units in May, 2004,

which provides recovery targets (abundance, distribution, productivity, and diversity/connectivity) identified by bull trout technical recovery teams, and provides focus and guidance for key watersheds in their recovery planning efforts for bull trout. While the draft plan sets broad recovery goals and objectives for bull trout, the USFWS is using the Stared Strategy watershed recovery planning process to identify specific actions that can be taken to meet bull trout recovery targets, and to elicit commitments to implement bull trout recovery in concert with salmon recovery in Puget Sound.

Date	Action	Reference
October 30, 1992	US Fish and Wildlife Service (USFWS) receives a petition to list bull trout as an endangered species throughout its range from the Friends of the Wild Swan, Alliance for the Wild Rockies, and the Swan View Coalition.	
June 10, 1993	USFWS publishes finding determining that the petitioners had provided substantial information indicating that listing of bull trout may be warranted in coterminous US, but precluded by higher priority work.	
December 4, 1997	Oregon Federal District Court orders USFWS to reconsider several aspects of previous findings concerning listing of bull trout, including whether listing of the Coastal-Puget Sound distinct population segment is warranted.	
January 12-14, 1999	USFWS convenes bull trout recovery teams.	
November 1, 1999	USFWS publishes Determination of Threatened Status for Bull Trout in the Coterminous United States; Notice of Intent to Prepare a Special Rule Pursuant to Sections 4(d) for the Bull Trout.	64FR 58910 64FR 58934
	Legal actions and settlement agreements related to critical habitat designation	
June, 2004	Draft recovery plan for Coastal/Puget Sound DPS published.	
June 25, 2004	Proposed Critical Habitat Designation for Coastal / Puget Sound Bull Trout	

**Figure 1.7 Chronology of Administrative Actions Relevant to the Listing of Coastal/Puget Sound Bull Trout to the US List of Threatened Species.**

Date	Action	Reference
March 14, 1994	A group of professional fisheries biologists known as PRO-Salmon petitions NMFS to list several populations of Washington State salmon as threatened species.	
September 12, 1994	NMFS announces that petitions to list populations of Chinook, chum, and other salmonids on the West Coast USA may have scientific merit, and initiates status reviews.	59FR 46808
February 7, 1996	NMFS policy for defining Evolutionarily Significant Units of West Coast Pacific salmon	61FR4722
March 9, 1998	Proposed Rule: Threatened Status for Puget Sound Chinook ESU.	63FR 11482
March 10, 1998	Proposed Rule: Threatened Status for Hood Canal Summer Chum ESU.	63FR 11774
March 24, 1999	Final Rule: Threatened Status for Puget Sound Chinook ESU.	64FR 14308
March 25, 1999	Final Rule: Threatened Status for Hood Canal Summer Chum ESU.	64FR 14508
January 3, 2000	Proposed 4(d) Rule Governing Take for Puget Sound Chinook and Hood Canal Summer Chum	65FR 170
February 16, 2000	Final Rule Designating Critical Habitat: PS Chinook and HC Summer Chum.	65FR 7764
July 10, 2000	Final 4(d) Rule Governing Take for PS Chinook and HC Summer Chum	65FR 42422
June 3, 2004	Proposed Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead	69FR 31354
June 14, 2004	Proposed Rule to list PS Chinook and HC Summer Chum following an update to the status review and incorporating the proposed policy on hatchery-origin fish.	69FR33101
Dec.14, 2004	Proposed rule: Critical Habitat Designation of Puget Sound Chinook ESU.	69CFR 239
March 11, 2005	Final Determination: Implementation of harvest Resource Management Plan will not appreciably reduce likelihood of the survival and recovery of Puget Sound Chinook ESU	70CFR 47

**Figure 1.8 Chronology of Key Administrative Actions Relevant to the Listing of Puget Sound Chinook and Hood Canal Summer Chum to the US List of Threatened Species.**



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- 1 Strong, consistent relationship: This occurs when salmon play (or historically played) an important role in this species' distribution, viability, abundance, and/or population status. The ecology of this wildlife species is supported by salmon, especially at particular life stages or during specific seasons. The relationship to salmon is direct (e.g., feeds on salmon or salmon eggs) and routine.
- 2 Recurrent relationship: The relationship between salmon and this species is characterized as routine, albeit occasional, and often tends to be in localized areas.